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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/577,527	03/02/2007	David Jonathan Hall	703734-000050	9606

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EXAMINER	
ELEY, JESSICA L	

ART UNIT	PAPER NUMBER
2884	

NOTIFICATION DATE	DELIVERY MODE
06/15/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/577,527	HALL ET AL.	
	Examiner	Art Unit	
	JESSICA L. ELEY	2884	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 March 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *28-42 and 44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *28-42 and 44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed March 15th, 2010 have been fully considered but are not persuasive.

Applicant argues that Perlman teaches away from the instant claims by disclosing only a one wavelength light source. While Examiner agrees that Perlman does not teach a multiwavelength light source, Perlman does teach the use of two different excitation wavlengths, 750 nm (C4 L51) and 570 nm (C6 L34), thus using a multiwavelength light source with Perlman would have a predictable result.

Applicant argues that Ntziachristos teaches away from a pulsed light source by disclosing a continuous wavelength. This argument is not persuasive since the teachings in Ntziachristos relied upon for the rejection regarded the concentration calculator and not the light source or the detector channel. As discussed below using a multiwavelength pulsed light source is known in the art and can be implemented with the teachings of Perlman and Ntziachristos with a predictable result.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject

matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 28-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perelman et al. US 6,321,111 B1 (*Perelman*), Ntziachristos et al. US 6,615,063 B1 (Ntziachristos), and Luryi et al. US 2003/0123058 A1 (*Luryi*).

Regarding claim 28, Perelman teaches an apparatus (FIG. 1A) for determining depth of a fluorophore in a turbid medium comprised within an object, said apparatus comprising:

a light source (10), optically coupled to a source channel (14) and said object (16), to inject light in said object at a desired point and excitation wavelength (C4 L59-60);

at least one detector channel (**18**), optically coupled to a photon detector and said object, in a backreflection geometry relative to said source channel (C4 L54-56), to acquire at least one temporal point spread function (e.g., time-resolved fluorescence signal, C5 L21-24) from a desired point of said object to determine depth of said fluorophore (C7 L8-13);

a means for spatially positioning said object relative to said channels (inherent in a device for medical imaging of internal body structures for diagnostic purposes, abstract); a depth calculator (**24**).

Perelman does not specifically teach the device having a concentration calculator. However, calculating the concentration of a fluorescing substance is a well known technique in the art of diagnostic fluorescence spectroscopy. Ntziachristos teaches that time-resolved fluorescence data can not only image intrinsic absorption and scattering but also fluorophore concentration (C11-12 L66-5). It would have been obvious to one of ordinary skill in the art at the time the invention was made to calculate fluorophore concentration with PC (**24**) in the apparatus taught by Perelman since the technique of calculating fluorophore concentrations as taught by Ntziachristos is recognized as a known technique and thus part of the ordinary capabilities of one skilled in the art.

Perelman does not teach the light source being a multiwavelength pulsed light source. Multiwavelength light sources are used when the fluorescent tags have different excitation wavelengths. Luryi teaches using a mutliwavelength pulsed excitation light source for samples that contain two or more fluorescent tags with different excitation wavelengths (¶0023-¶0024). It would be obvious to one of ordinary skill in the art at the time the invention was made to use a multiwavelength pulsed light source taught by Luryi since Luryi teaches that the technique of using a pulsed multiwavelength source can

identify different fluorescent species distinguished by their fluorescence excitation and emission resulting in enhanced fidelity of fluorophore identification (¶0024).

Regarding **claim 29, 31-35**, Perelman teaches the apparatus as claimed in claim 28, but does not specify a configuration, thus leaving it to one of ordinary skill to determine. The claim is obvious because a configuration wherein said source and detector channels are either in contact, free-space, in a fixed position, on a gantry/platform (obviously transparent to emission wavelengths), or independently movable, are well known configurations in the art and may be implemented with predictable results.

Regarding **claim 30**, Perelman teaches the apparatus as claimed in claim 28 wherein said channels comprise optical coupling means is an optic fiber **14**.

Regarding **claim 36**, while Perelman does not teach an embodiment where the light source utilizes more than one wavelength, the use of a multiwavelength light source would have been obvious to one of ordinary skill in the art at the time the invention was made in view of the teachings of Ntziachristos (C12 L58-66), since as taught by Ntziachristos, imaging at two wavelengths is necessary so that accurate forward models can be created for the excitation field from the source fluorophore and emission field.

Regarding **claims 37-39**, absent some degree of criticality, using a plurality of source/detector configurations, or a plurality of source and detector elements would have been an obvious if not inherent design choice for one of ordinary skill.

Regarding **claims 40 and 41**, Perelman teaches the apparatus as claimed in claim 28 further comprising wavelength selection means (**14**) between said source and said object for selecting one or more emission/excitation wavelength (C4 L59-65).

Regarding **claim 42**, Perelman teaches the apparatus as claimed in claim 28, furthermore teachings that trans-illumination imaging/geometry operating in the time-domain is a known alternative in the prior art (C7 L30-32), and thus part of the ordinary capabilities of one skilled in the art at the time the invention was made.

Regarding **claim 43**, Perelman teaches the method as claimed in claim 15 wherein said emission intensity is obtained in a modality selected from time domain, frequency domain and continuous wave (C3 L15-18).

Regarding **claim 44**, Perelman teaches the apparatus as claimed in claim 28 furthermore, absent some degree of criticality, an additional detector channel would have been obvious to one of ordinary skill in the art especially one seeking to take advantage of a known alternative configuration such as trans-illumination was taught by Perelamn (C7 L30-32).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action.

In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JESSICA L. ELEY whose telephone number is (571)272-9793. The examiner can normally be reached on Monday - Friday 10:00-6:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David P. Porta/
Supervisory Patent Examiner, Art Unit 2884

/J. L. E./
Examiner, Art Unit 2884